

NOTES ON SOME NEMATODES IN THE MUSEUM OF THE LIVERPOOL SCHOOL OF TROPICAL MEDICINE

BY

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PORROCAECUM CROCODILI, n. sp.

Host :—Crocodile. Position :—Stomach. Locality :—Gold Coast.

This worm is of medium size (6·7 by 0·25 mm. to 32 by 1 mm.). The body tapers gradually towards the head, and terminates abruptly at the posterior extremity ; it is marked by fine transverse striations and a few scattered, minute papillae ; at a distance of about 0·7 mm. from the anterior extremity are two small cervical papillae, placed laterally and just posterior to the nerve ring. The excretory pore is large and somewhat resembles a papilla ; it is, as is usual in this genus, situated between the bases of the two subventral lips. The three lips forming the head (figs. 1 and 2) are 0·13 to 0·18 mm. in diameter, and a little more than half that height ; they present a semi-lunar outline when viewed laterally, and two antero-internal lobules are seen standing above the semicircular anterior margin of the lips ; each of these lobules carries eight or ten denticulations, the rest of the lips is not armed in this way. The dorsal lip carries two long papillae, notched about their middle, while the two subventral lips only have one papilla each, carried towards the ventral side of the centre of the lips. Viewed anteriorly, the lips are seen to have a notch about the middle of their internal aspect, which might be said to divide the anterior lobe of the lip into two. Each lip is marked off from the body by a definite line round its base. The oesophagus is long and slender, measuring up to 4·87 mm. in length (about one-seventh of the total length of the worm), its diameter is uniform throughout the whole length ; a straight, oblong, oeso-

phageal ventriculus is present, measuring about 0.675 mm. long, and there is a well-developed intestinal caecum, extending forward from the end of the intestine to a point slightly anterior to the middle of the oesophagus.

The male measures 8.00 to 24.75 mm. in length and 0.45 to 0.80 mm. in its greatest diameter. The two spicules are of equal

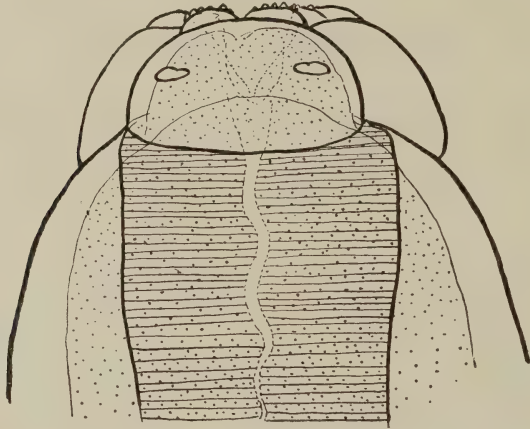


FIG. 1. *Porrocaecum crocodili*, n.sp. Head, dorsal view. $\times 253$.

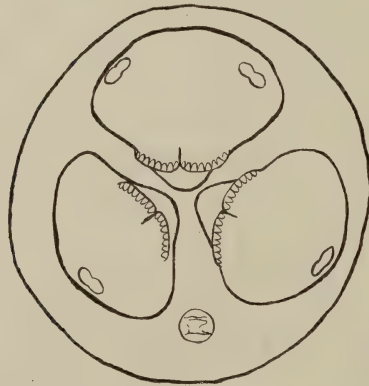


FIG. 2. *Porrocaecum crocodili*, n.sp. Head, anterior view. $\times 196$.

length, tubular in form, not alate, and measuring 0.58 to 0.78 mm. in length. A small but well-defined gubernaculum is present, 0.075 to 0.08 mm. long; caudal alae are absent. The caudal papillae are in two groups (figs. 3 and 4): firstly a long file of 30 to 37 pedunculated

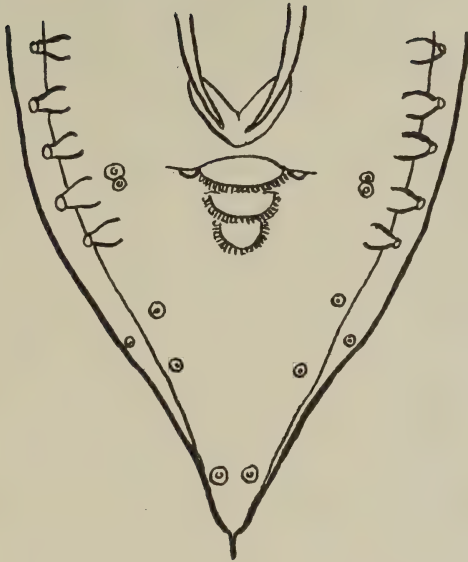


FIG. 3. *Porrocaecum crocodili*, n.sp. Caudal extremity of male, ventral view. $\times 160$.

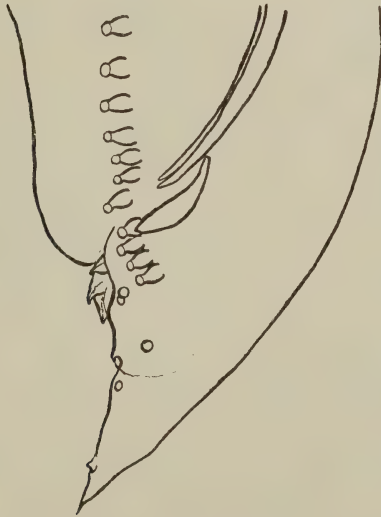


FIG. 4. *Porrocaecum crocodili*, n.sp. Caudal extremity of male, lateral view. $\times 260$.

papillae on either ventro-lateral aspect, the posterior three or four pairs being postanal; and secondly, six pairs of sessile papillae: one ventral, level with the cloaca, a double papilla subventral at the same level, a group of three subventral, forming a triangle half-way between the cloaca and extremity of the tail, and one larger pair placed ventrally further back. Immediately behind the cloaca are three curious semicircular projections from the cuticle; these are directed backwards and have very thin, serrated, free edges; viewed laterally, they look like sharp spines directed backwards from the cloaca. The extremity of the conical tail is an extremely acute point; the distance from the tip to the cloaca is about 0.18 mm.

The female measures 6.7 to 32 mm. in length and 0.25 to 1 mm. in greatest diameter; the vulva is placed just in front of the middle of the body; from here the vagina passes backwards to where it finally divides into the two branches of the uterus. Behind the anus the tail rapidly tapers off to end in a short, sharp point; the length of the extremity beyond the anus is about 0.21 mm.

It must be noted that the specimens available were not gravid.

AMPLICAECUM AFRICANUM, n.sp.

Host:—*Bufo regularis*. Position:—Stomach. Also found in the stomach of a crocodile along with the bones of a frog or toad. Locality:—West Coast of Africa.

This worm is of medium size, measuring 22 to 50 mm. in length and up to as much as 1.2 mm. in thickness. The body gradually tapers towards the head, but terminates abruptly behind in an obtuse cone, which, in the female, is remarkably short. The cuticle is thick and marked with fine transverse striations; the posterior extremity is usually coiled. The excretory pore is situated at about 0.75 mm. from the head, while at a slightly higher level is the nerve ring and two small, sessile cervical papillae. A dorsal papilla may be present, situated about 1.5 mm. from the head. The three lips (fig. 5) are more or less rectangular and measure about 0.27 mm. in diameter; each presents two grooves on its inner aspect, one parallel to the long axis of the body, and one transversely; denticulations are easily seen, and follow the margins of the lips throughout their whole extent. The dorsal lip carries two large papillae, and each

ventro-lateral lip one large and one small papilla; the large papilla, as usual, being placed towards the ventral side of the lip, and the small one laterally and a little more anteriorly. The large papillae present the peculiar appearance of having a segment cut out of their

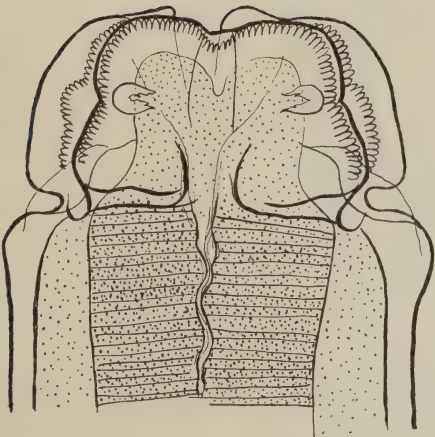


FIG. 5. *Amplicaecum africanum*, n.sp. Head, dorsal view. $\times 190$.

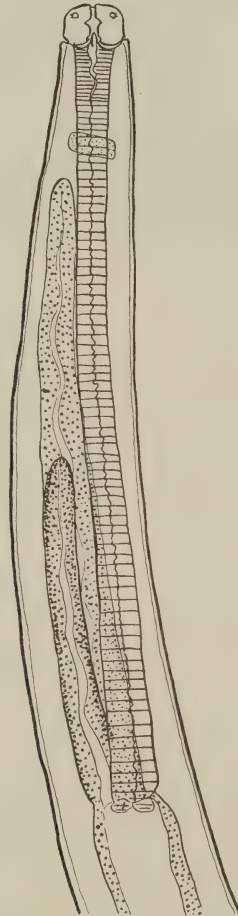


FIG. 6. *Amplicaecum africanum*, n.sp. Oesophageal portion, showing two intestinal caeca. $\times 40$.

inner aspect. The pulp is divided into two equal lobes with even, rounded ends; small interlabia are present, from which well-marked grooves encircle the bases of the lips. The oesophagus is 3.0 to 4.5 mm. in length (about one-eleventh of the length of the worm)

and about 0.27 mm. wide, throughout its whole length, excepting for a little widening at its two extremities. One large intestinal caecum is present—length about 3.57 mm.—and just where it leaves the intestine it measures about 0.42 mm. in diameter, becoming narrower towards the anterior extremity, and terminating about 0.9 mm. from the head. Sometimes a second caecum is found to be present, and when this occurs, it is only half the length of the one normally seen (fig. 6).

The male measures from 22 to 30 mm. in length and 0.46 to 0.68 mm. in its greatest width; the width at the anus is about 0.35 mm. and the length of the caudal extremity behind the anus about 0.31 mm. Well-developed caudal alae are present, into the

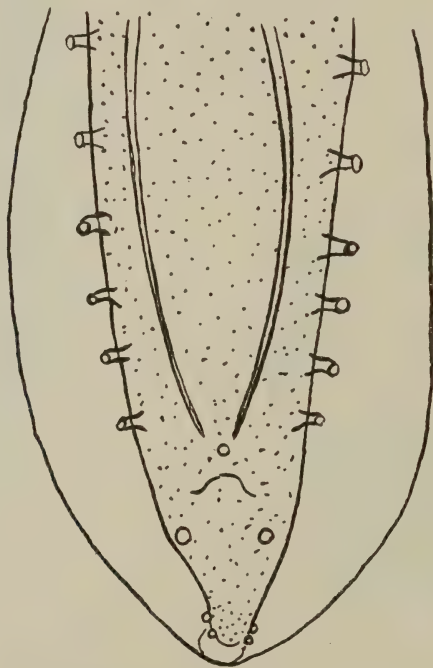


FIG. 7. *Amplicaecum africanum*, n.sp. Caudal extremity of male, ventral view. $\times 110$.

substance of which the pedunculated preanal papillae run (figs. 7 and 8); these papillae are 10 to 12 in number, the anterior members being sessile and small. Postanal papillae are three in number on either side, two very small pedunculated papillae placed laterally

near the extremity, and one larger, sessile papilla placed sub-ventrally just behind the cloaca; there is one unpaired median papilla on the elevation in front of the anus. The spicules are equal and measure about 0.85 mm. in length and 0.013 mm. in diameter; they have a sharp barb at their extremities. Gubernaculum is absent.

The female measures 32 to 50 mm. in length and 0.66 and 1.2 mm. in width; the vulva is situated anterior to the middle, the vagina can be traced backwards from here, and the coils of the ovaries are placed in the posterior part of the body up to 1.5 to 2 mm. from the caudal extremity. The caudal extremity is blunt, extending for about 0.3 mm. behind the anus; it carries a small pointed button at

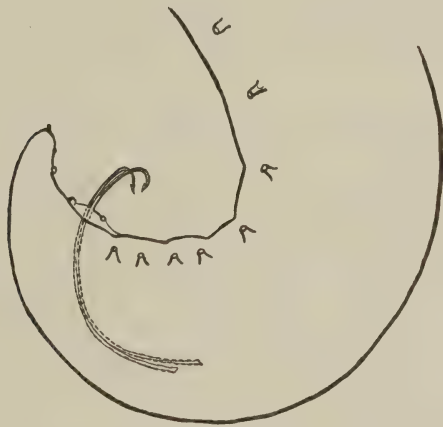


FIG. 8. *Amplificaecum africanum*, n.sp. Caudal extremity of male, lateral view. $\times 55$.

the tip; the width at the anus is 0.63 mm. The eggs are oval and large, 135 by 83μ ; the shell is thin and opaque, being marked with numerous small depressions on its surface.

This worm shows considerable similarity with *Amplificaecum colurum* from the eagle (Baylis, 1919), but in the latter species the oesophagus is about one-seventh the complete length of the worm, while the papillae on the dorsal lips are absent. Unfortunately, Baylis had only two female specimens, so that it is impossible to say how closely the species here described resembles *A. colurum*: the identity of the species does not, however, seem probable in view of their two widely different hosts.

On comparison with *Ampliscaecum varani*, the only other known species of this genus, the differences are again found to be slight, but, apart from mere difference in size, the intestinal caecum measures one-thirteenth of the body length in the species here described, against only one-twenty-fourth in *A. varani*; and the caudal papillae of the male are fewer in number, being fourteen pairs of preanal papillae, against thirty-two in *A. varani*, and three pairs of postanal against five in *A. varani*.

It is interesting to note the presence in some individuals of two intestinal caeca, and it appears that this is a character in which some individual variation may be expected to occur. Baylis (1921) has drawn attention to a somewhat similar variation in *Polydelphis quadricornis* and (1922) in *P. sewelli*, in which two species only some individuals showed the presence of this intestinal appendage.

***STRONGYLURIS BREVICAUDATA*, Müller, 1894**

Host :—*Agama colonorum*. Position :—Intestine. Locality :—Northern Nigeria.

Body tapers gradually from the middle to the head, and measures 5.5 to 12 mm. in length. The cuticle is thick and marked with fine transverse striations and carries numerous minute papillae arranged at fairly regular intervals in longitudinal lines; the intervals between the papillae increase towards the posterior extremity. These papillae are much more clearly seen in some specimens than in others, but I have not seen any special crown of papillae below the head. The head (fig. 9) is formed by three lips and is narrower than the neck immediately behind, so that a 'shoulder' is formed. Each of the three lips carries a pair of papillae, while at the anterior edge is a very delicate membrane which can only be seen when the lips are extended forward; in specimens where the lips are closed together this membrane is out of sight, but seen on edge when extended, it gives to the lip a hooked appearance. Behind the mouth is a well-developed pharynx (fig. 10) 0.18 to 0.23 mm. in length; at its junction with the second part of the oesophagus is a small cavity in the form of a kink in the lumen of the tube. The second portion of the oesophagus usually describes one or two wide curves before reaching the bulb at the posterior end; the length of the entire

oesophagus is 1.8 to 2.4 mm., from $\frac{1}{5.2}$ to $\frac{1}{3}$ of the length of the whole worm. The nerve ring is placed about twice the length of the pharynx from the head. The intestine, at its junction with the oesophagus, is considerably wider than the oesophageal bulb.

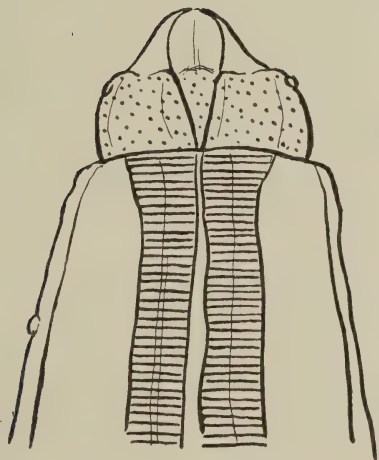


FIG. 9. *Strongyluris brevicaudata*. Anterior extremity. $\times 333$.



FIG. 10. *Strongyluris brevicaudata*. Oesophageal portion. $\times 40$.

The male measures 5.5 to 9.6 mm. in length and 0.33 to 0.6 mm. in its widest part. The caudal alae (fig. 11) are wide and short, and

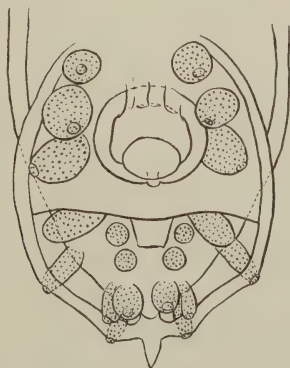


FIG. 11. *Strongyluris brevicaudata*. Caudal extremity of male, ventral view. $\times 125$.

have thickened margins which almost meet on the ventral surface in front of the preanal sucker. The papillae number ten pairs. Of these, three are placed at the side of the preanal sucker, the anterior one is often small and sometimes absent, while the middle and posterior ones are large flask-shaped papillae. Of the remaining seven pairs, two sessile pairs are placed ventrally at the side of the anus, while two pedunculated pairs are placed lateral to these, the other three pairs of papillae being grouped on either side of the extremity. Some specimens show one or two very small, sessile papillae sub-ventrally placed in front of the anus. The length of the caudal extremity behind the cloaca is 0.07 to 0.11 mm. ($1/105$ to $1/75$ of the length of the whole worm); it has a small spike at the extreme end. The preanal sucker has a strongly chitinised rim and is circular in outline, measuring 0.12 mm. in diameter. The spicules are in the form of long, tapering tubes of equal measurement from 1.5 to 1.95 mm. ($1/5.6$ to $1/3.6$ of the body length) and have a reticulated surface.

The female measures 6.75 to 12 mm. in length and 0.345 to 0.855 mm. across the widest part; the vulva is situated posterior to the middle and takes the form of a transverse slit with salient lips. The vagina describes a very winding course; after first taking a forward direction for about 0.42 mm., it bends backwards, dividing into the two branches of the uterus; these continue to a point about 1.2 mm. from the caudal extremity, where they bend forward again to reach the ovaries, which are situated in the anterior part of the body. The caudal extremity of the female is in the form of a short cone 0.12 to 0.21 mm. long from anus to extremity and carries two small papillae. The eggs are oval, about 73μ by 43μ in size, unsegmented, and with a thick, smooth shell.

Details of measurement of closely allied members of the genus *Strongyluris* are compiled in Table I. The morphological characters of these seven species, as described by the various observers, are practically identical; *S. gigas* is the only species showing marked variation in detailed measurements from the one described above, while *S. calotis*, *S. ornata* (Gendre) and *S. ornata* (Linst.) only show variation in the ratio of spicule length to body length. It seems more than likely that the strongylurids described under the specific names *chamaelonis*, *streptosopagus* and *brevicaudata* are one and the

TABLE I. Details of measurements of allied species of *Strongyluris*.

Name	<i>S. brevicaudata</i> , Müller [Spaul, 1923]	<i>S. brevicaudata</i> , Müller here described	<i>S. streptoccephagus</i> , Connall, 1912	<i>S. chamacensis</i> , Baylis & Daubney, 1922	<i>S. cabotis</i> , Baylis & Daubney, 1923	<i>S. ornata</i> (Gendre) [Spaul, 1923]	<i>S. ornata</i> (Linst.) [Spaul, 1923]	<i>S. fagezi</i> , Spaul, 1923
Host	...	...	...	...	...	...	...	...
Locality	East Africa	West Africa	West Africa	Calcutta	Ceylon	Africa	Madagascar	East Africa.
Length	♂ 9.6 ♀ 10.5	♂ 5.5-9.6 ♀ 6.75-12	♂ 8.6 ♀ 9.1	♂ 6.3 ♀ 8.4-8.75	♂ 8.9-11.1 ♀ 11-13.65	♂ 12-15 ♀ 13-17	♂ 12 ♀ ...	♂ 32 ♀ 35
Breadth	0.45	0.33-0.6	0.44	0.5-0.7	0.4-0.5	0.76-0.84	0.83	1.2-1.5
Length of tail	0.1	0.07-0.11	0.01	0.13	0.1-0.12	...	...	0.25
Relative length of tail	1/95	1/50	1/860	1/48	1/90	1/93	1/100	1/125
Length of pharynx	0.25	0.18-0.22	0.23	0.18-0.22	0.26-0.3	...	...	0.3
Length of oesophagus	1.9	1.8-2.17	1.58	1.1	1.75-2.25	...	...	3
Relative length of oesophagus	1/5.1	1/4.9	1/5.4	1/5.7	1/6.3	1/5.6	1/12	1/10
Length of spicules	1.3	1.5-1.95	1.2	1.1	0.75-0.8	1.5	1.06	1.1
Relative length of spicules	1/7.4	1/5.6	1/7	1/5.7	1/14	1/10	1/11	1/29
Width of oesophagus	0.04	0.043-0.068	0.08	...	...	...	...	0.085
Vulva from post. ext.	3.5	3.75-6.75	3.35	3-3.3	4.7-5.65	...	...	...
Ratio of above measurement to body length	1/30	1/22	1/27	1/26	1/24	1/23	1/20	...
Sucker from post. ext.	...	0.2	0.76	...	...	...	...	0.4
Diameter of head	...	0.07-0.08	...	...	0.06-0.08	...	...	...
Eggs, length	63μ	73μ	60μ	87.5μ	87.5μ-97.5μ	76μ	70μ	150μ
Eggs, breadth	48μ	43μ	30μ	55μ	59μ	44μ	47μ	90μ

All the above figures are in mm. unless otherwise stated.

same species, while it is not improbable that the species *calotis*, *ornata* (Gendre) and *ornata* (Linst.) will also prove to be identical with the genotype *S. brevicaudata*.

AFRICANA AFRICANA (Gendre)

Host :—Lizard (species of skink) and *Bufo regularis*. Locality :—Northern Nigeria.

This worm is of small size, 3·17 to 5·77 mm. long ; the cuticle, which is thin, is marked with fine cross striations ; longitudinal lines in the musculature show clearly through ; there are two narrow lateral flanges 19 to 29 μ in width which terminate a short distance from either extremity ; a few minute papillae may be seen on the body surface. The mouth is surrounded by three sub-globular lips (fig. 12), each bearing a pair of papillae, and separated



FIG. 12. *Africana africana*. Anterior extremity. $\times 253$.



FIG. 13. *Africana africana*. Oesophageal portion. $\times 53$.

from the neck by a well-marked line ; the diameter of the head is 50 to 68 μ and its depth 26 to 29 μ . The excretory pore is situated about half-way down the oesophageal portion of the body. Following the small infundibuliform mouth cavity is a short pharynx 46 to 60 μ in length, which widens posteriorly to form a small cavity, but the

ventral kink seen so plainly in *Strongyluris* is not present. The oesophagus (fig. 13) 1.05 to 1.2 mm. in its entire length, usually describes two curves between the pharynx and the bulb; this latter structure is well-developed and measures about 0.200 by 0.180 mm.; the intestine at its junction with the oesophagus is wider than the bulb.

Male, 4.5 to 4.95 mm. in length and 0.321 to 0.37 mm. at its widest measurement; it has two slightly unequal spicules varying in length from 1.55 to 1.73 mm. and up to 0.846 mm. in breadth at their widest part; there is a ventral notch at the proximal end, and each spicule presents two ventral gutters running parallel throughout the greater part of its length to a point near the apex; the surface of the spicules is reticulated. Caudal alae are present, apart from the lateral flanges, and measure about 0.075 mm. at their widest part, which is about the level of the preanal sucker. The tail (figs. 14 and 15) is



FIG. 14. *Africanana africana*. Caudal extremity of male, lateral view. $\times 55$. FIG. 15. *Africanana africana*. Caudal extremity of male, ventral view. $\times 80$.

conical and ventrally curved; it measures 0.21 to 0.28 mm. from the cloaca to the extremity which carries a small spike. The caudal papillae number nineteen pairs, twelve preanal, four postanal and three dorsal; of the preanal there is a subventral line of six in front

of the preanal sucker ; these increase in size from before back, three other pairs are placed subventrally at the side of the sucker, one pair almost laterally, mid-way between sucker and cloaca,* one pair subventrally immediately in front of the cloaca, and one very small pair ventrally on the prominence just in front of the cloaca. Of the postanal papillae three pairs form a ring on the ventral and subventral surface, while the fourth pair is placed subventrally just behind the anus. The three dorsal papillae are posterior to the anus. The preanal sucker is circular in outline, 55 to 66 μ in diameter and has a well-fortified chitinous rim.

The female measures 3.15 mm. to 5.77 mm. in length and 0.21 to 0.375 mm. in maximum diameter ; the vulva, which is not salient, is situated anterior to the middle of the body, 1.8 to 3.67 mm. from the posterior extremity ; the vagina follows a winding course, but in general runs back from the vulva ; the ovaries are situated in the anterior part of the body. The caudal extremity is 0.22 to 0.34 mm. in length and tapers off to a very fine point. The eggs have a thick smooth shell and measure 66 by 42 μ to 86 by 46 μ ; they are not segmented when laid.

Table No. II gives detailed measurements from the three known species of this genus, *A. africana*, Gendre (1909), *A. acuticeps* and *A. brodeni*, Gedoelst (1916) with measurements from the worm above described. These species seem to be very closely allied and the only difference of any diagnostic value seems to be the number and arrangement of papillae on the caudal extremity of the male.

* By an oversight I have omitted this papilla in making the final drawing for fig. 15.

TABLE II.

Details of measurements of the species of *Africana*.

Name	<i>A. africana</i> (Gendre, 1909)		<i>A. africana</i> (Gendre, 1909) measurements made from worm described in text		<i>A. acuticeps</i> (Geddoelst, 1916)		<i>A. brodeni</i> (Geddoelst, 1916)	
	♂	♀	♂	♀	♂	♀	♂	♀
Length	5-7	6.7-8	4.5-4.95	3.15-5.77	6.5-7	6.8-8.5	6.5	7.8
Breadth	0.36-0.46	0.42-0.48	0.321-0.37	0.21-0.375	0.385-0.39	0.4-0.415	0.45-0.465	0.385
Depth of head ... ..	...	...	23-29μ	26-29μ	...	20μ	...	20μ
Diameter of head ... ..	...	...	50μ	50-68μ	...	47-52μ	...	56μ
Length of pharynx ... ..	...	...	46-50μ	48-60μ	65-70μ	...	72μ	...
Length of oesophagus ... ..	...	...	1.12-1.14	1.05-1.20	...	1.00	...	1.28
Ratio to entire worm	$\frac{1}{3.8}$ - $\frac{1}{4}$	$\frac{1}{4}$ - $\frac{1}{4.4}$	$\frac{1}{4}$ - $\frac{1}{4.3}$	$\frac{1}{3}$ - $\frac{1}{4.8}$	$\frac{1}{5}$	$\frac{1}{5.5}$	...	$\frac{1}{4.1}$
Length of bulb ... ..	...	...	...	200μ	...	200-230μ	...	...
Width of bulb ... ..	...	...	...	180μ	...	170-180μ	...	185μ
Length of tail ... ..	...	...	0.21-0.28	0.22-0.34	0.24-0.25	0.30-0.34	0.29	0.36
Ratio to entire worm	$\frac{1}{19.5}$ - $\frac{1}{23}$	$\frac{1}{17}$ - $\frac{1}{17.5}$	$\frac{1}{21}$ - $\frac{1}{18}$	$\frac{1}{14.5}$ - $\frac{1}{17}$	$\frac{1}{21}$ - $\frac{1}{28}$	$\frac{1}{22}$ - $\frac{1}{25}$	$\frac{1}{21}$	$\frac{1}{21}$
Length of spicules	1+	...	1.55-1.73	...	1.8 and 2.0	...	1.85 and 1.69	...
Ratio to entire worm	$\frac{1}{5}$	...	$\frac{1}{2.9}$ - $\frac{1}{2.8}$	...	$\frac{1}{3.5}$	...	$\frac{1}{3.5}$	...
Diameter of sucker ... ..	...	...	63-66μ	...	64μ	...	55μ	...
Distance of vulva from posterior end	...	...	...	1.8-3.67	...	...	...	...
Ratio of above to body length	...	$\frac{10}{16.6}$	...	$\frac{10}{17}$ - $\frac{10}{16}$	...	$\frac{10}{17}$	...	$\frac{10}{14}$
Eggs, length ... ..	...	60-66μ	...	66-86μ	...	64-68μ	...	75-80μ
Eggs, breadth ... ..	...	39-41μ	...	44-46μ	...	40-44μ	...	48-52μ

All the above figures are in mm. unless otherwise stated.

OXYURIS PRAEPUTIALIS Skrjabin, 1914

Host :—*Bufo regularis*. Locality :—Nigeria.

Unfortunately only female specimens were available, and as the male has not yet been described, the species cannot be referred to its proper genus. The characters presented by the female are as follows :—

Body white, 2·85 to 4·95 mm. in length by 0·21 to 0·435 mm. in width at its broadest part ; it tapers from the level of the oesophageal bulb towards the head and is usually coiled, or twisted into the form of the letter 'S.' The cuticle is crossed with very fine striations and bears a few minute papillae in the cervical region. The posterior extremity (fig. 16) tapers rapidly behind the anus, and terminates in

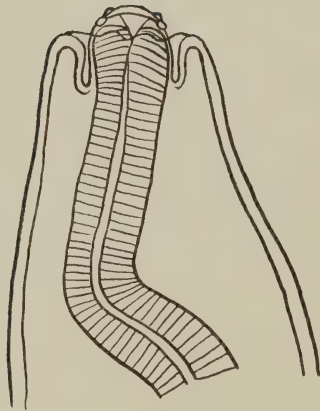


FIG. 16. *Oxyuris praeputialis*. Anterior extremity, head retracted. $\times 253$.



FIG. 17. *Oxyuris praeputialis*. Posterior extremity of female. $\times 73$.

a very fine, straight spike, from 0·24 to 0·495 mm. in length. Small lateral flanges are present, commencing about 0·06 mm. behind the head and terminating about the same distance from the spike at the caudal extremity. The head (fig. 17) is formed by three lips 0·06 to 0·083 mm. wide, each bearing two comparatively large papillae and a short, anterior, marginal membrane. The whole head seems to

be capable of withdrawal within a cuticular fold of the neck and in some specimens it is almost completely hidden there. The nerve ring is situated about 0.16 mm. from the anterior extremity and the excretory pore 0.3 to 0.36 mm. from the same point.

In specimens where the head is retracted, the first portion of the oesophagus is always bent in the form of a double curve; its diameter is 0.053 to 0.06 mm. and the muscular portion seems to run well up into the bases of the lips. The oesophageal bulb is a well-formed structure, more or less spherical in shape and measures about 0.13 mm. in diameter; the complete length of the oesophagus is 0.42 to 0.60 mm. The vulva is placed anterior to the middle of the body, 1.85 to 2.7 mm. from the posterior extremity, tracing the vagina inwards it is found, after a short forward bend to turn backward, in which direction it continues to a point near the anus; the ovaries are situated in the anterior part of the body.

The worm is ovoviviparous; many specimens were found to contain numerous larvae.

TRICURIS DISCOLOR (Linstow, 1909)

Host:—Cow. Position:—Intestine. Locality:—Lancashire.

Body white, cuticle ringed with striations at intervals of about 7.5μ , contour of the narrow anterior part serrate, two lateral vesicular swellings may be seen at the head.

The male measures 50.25 to 58.75 mm. in length; the narrow oesophageal portion is 33.75 to 38.5 mm. long and 0.175 mm. broad, and represents about two-thirds of the complete length of the worm; the thicker posterior portion is 16.5 to 20.25 mm. long and 0.55 to 0.75 mm. at its widest part. The spicule measures 1.95 to 2.3 mm. in length and only 10.0 to 11.5μ in thickness, being less than half the size of that of *T. ovis* in both measurements (fig. 18). The spicule sheath has a diameter of 165μ and is covered with spines, these being larger in size and not so closely spaced as in *T. ovis*. Although no specimens were found with spicule extruded, nothing was visible to correspond with the expanded portion at the extremity of the evaginated spicule sheath of *T. ovis*.

The female measures 43.00 to 51.75 mm. in length, the anterior portion is 33.00 to 39.00 mm. long and 0.165 mm. broad and

represents three-quarters of the entire length; the thicker posterior portion is 10.00 to 12.75 mm. long and 0.825 mm. broad. The egg measures 60 by 30μ to 73 by 33μ , and, excluding the opercula, 43 to 46μ .

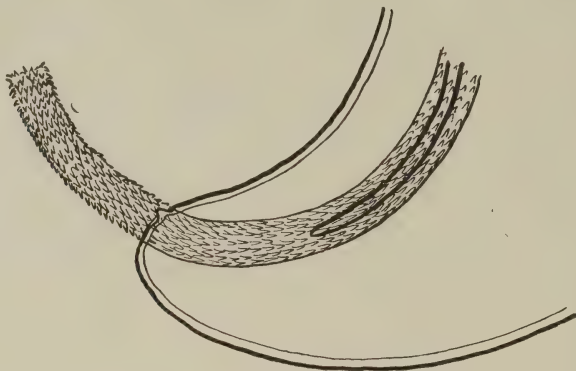


FIG. 18. *Tricuris discolor*. Caudal extremity of male, lateral view. $\times 190$.

So far as can be ascertained, this species has not previously been recorded in this country.

PHYSALOPTERA PRAEPUTIALIS v. Linstow, 1889

Synonym:—*Chlamydonema felineus* Hegt, 1910

Material: four female specimens from the dog corresponding in every way with the description of this species.

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